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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|------------------------|-------------|----------------------|---------------------|------------------|
| 09/639,917 | 08/16/2000 | Joseph M. Brand | 108298530US | 4048 |
| 25096 | 7590 | 07/13/2006 | EXAMINER | |
| PERKINS COIE LLP | | | MITCHELL, JAMES M | |
| PATENT-SEA | | | ART UNIT | |
| P.O. BOX 1247 | | | 2813 | |
| SEATTLE, WA 98111-1247 | | | PAPER NUMBER | |

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 09/639,917 | Applicant(s) BRAND, JOSEPH M. | |
| | Examiner James M. Mitchell | Art Unit 2813 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-9,32-36 and 64-82 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-9,32,34-36,64-69,71-74 and 76-80 is/are rejected.
- 7) ☒ Claim(s) 33,70,75,81 and 82 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response applicant's amendment filed February 21, 2006.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2 and 4-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowry et al. (U.S. 6,335,208) in combination with Kojima et al. (U.S. 5,723,900)

4. Lowry (Fig 1, 2) discloses:

(cl. 2, 7) a method for packaging a microelectronic substrate (understood to mean a chip) comprising: disposing encapsulation material (24) in direct contact with a surface of the microelectronic substrate (computer shuts down when contacts IC; Col. 2, Lines 9-21) and exposing at least a portion of the surface of the microelectronic substrate by removing a portion of the encapsulating material ("LASER") in direct contact with the microelectronic substrate with the microelectronic substrate in operable condition after the portion of the encapsulating material is removed (i.e. see if meets specification; Col. 1, Lines 26-30) wherein removing includes directing laser radiation toward the encapsulating material (Fig. 2); wherein IC has a first and second surface opposite a first surface and facing away from a support (4).

Art Unit: 2813

(cl. 9) wherein the encapsulating material is sequentially removed (i.e. start from top surface and then go deeper into surface resulting in the sequential removal of material).

5. Lowry discloses the elements stated in paragraph 5 and power (watts) by its use of a laser, but does not show a memory chip or heat dissipation, but does not appear to disclose how much power is used.

6. Kojima (Fig 8) teaches a memory chip (Col. 6, Line 10) and transferring heat by transmitting it directly away from the exposed portion of the surface of the microelectronic substrate and therefore by convection; mounting the microelectronic substrate to a printed circuit board (29; Col. 5, Line 62).

7. It would have been obvious to one of ordinary skill in the art to incorporate a memory chip in the structure of Lowry in order to provide a an integrated chip as required by Lowry (Col. 1, Lines 5, 49) and to form a heat sink on the back surface of Lowry in order to improve heat radiation as taught by Kojima (Col. 5-6, Lines 66-2).

8. With respect to the claim 8 limitations that the laser has a power from 4 to 25 watts, it would have been obvious to one ordinary skill in the art to have a laser at 4 to 25 watts, since it has been held that discovering optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

Art Unit: 2813

9. Claims 2-9, 32, 34-36, 64-69, 71-74 and 76-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang (U.S. 6,218,731) in combination with Kojima et al. (U.S. 5,723,900) and Lowry et al. (U.S. 6,335,208).

10. Huang (3; Col. 3-4, Lines 35-9) discloses:

(cl. 2, 3, 32, 64, 65) a method for packaging a microelectronic substrate, the method comprising mounting the microelectronic substrate (116) to a dielectric support member (104) with a first surface of the microelectronic substrate facing the dielectric support member and a second surface of the microelectronic substrate facing opposite the first surface with bond sites (105), electrically coupling the microelectronic substrate to the dielectric support member by passing wire (124) bonds through an aperture (e.g. opening, not labeled) in the support member and connecting one end of each wire bond to the support member and an opposite end of each wire bond to the microelectronic substrate (116), disposing an encapsulating material (126) over the second surface of the microelectronic substrate and at least a portion of the support member,

(cont. cl. 65) a first portion of the encapsulating material projects from the surface of the support member (i.e. substrate covered with encapsulant shown; Fig. 3).

11. Huang does not appear to disclose that its microelectronic is a memory chip, removal of its encapsulation exposing a second surface by laser or attaching a heat dissipation member.

12. Kojima (Fig. 8) teaches a memory chip (Col. 6, Line 10) and transferring heat by transmitting it directly away from the exposed portion of the surface of the

Art Unit: 2813

microelectronic substrate and therefore by convection; mounting the microelectronic substrate to a printed circuit board (29; Col. 5, Line 62).

13. It would have been obvious to one of ordinary skill in the art to incorporate a memory chip in the structure of Huang in order to provide a an integrated chip as required by Huang (Col. 3, Lines 60-61) and to form a heat sink on the back surface of Lowry in order to improve heat radiation as taught by Kojima (Col. 5-6, Lines 66-2).

14. Lowry (Fig2) teaches removal of encapsulation by laser by removing a first portion and second portion under the first encapsulant portion (i.e. laser starts from top surface and then go deeper into surface resulting in the sequential removal of material).

15. It would have been obvious to one of ordinary skill in the art to incorporate to incorporate the process of removing portions of the encapsulation of the modified structure of Huang and to expose a second surface of its chip in order monitor the manufacturing process as taught by Lowry (Col. 1, Lined 24-30).

16. With respect to the thickness removed in claims 69 and 74, applicant has not disclosed that it is for a particular unobvious purpose.

17. As such, the limitation is obvious since it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Art Unit: 2813

18. With respect to the wattage of claims 37, 67 see paragraph 8 of this office action.

19. Claim 64-65, 69, 74, 76, 78, 79, 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (U.S. 6,218,731) combination with Kojima et al. (U.S. 5,723,900).

20. Huang (3; Col. 3-4, Lines 35-9) discloses:

(cl. 64, 65) a method for packaging a microelectronic substrate, the method comprising mounting the microelectronic substrate (116) to a dielectric support member (104) with a first surface of the microelectronic substrate facing the dielectric support member and a second surface of the microelectronic substrate facing opposite the first surface with bond sites (105), electrically coupling the microelectronic substrate to the dielectric support member by passing wire (124) bonds through an aperture in the support member and connecting one end of each wire bond to the support member and an opposite end of each wire bond to the microelectronic substrate (116), disposing an encapsulating material (126) over the second surface of the microelectronic substrate and at least a portion of the support member,

(cont. cl. 65) a first portion of the encapsulating material projects from the surface of the support member (i.e. substrate covered with encapsulant shown; Fig. 3).

Art Unit: 2813

21. Huang does not appear to disclose removal of its encapsulation exposing a second surface or attaching heat dissipation.

22. Kojima (Fig 4J,I, 8) teaches removal of encapsulation and exposure of a second surface of its chip and transferring heat by transmitting it directly away from the exposed portion of the surface of the microelectronic substrate and therefore by convection.

23. It would have been obvious to one of ordinary skill in the art to incorporate to incorporate the process of removing portions of the encapsulation of Huang and to expose a second surface of its chip in order to attach a heat sink in order to improve heat radiation as taught by Kojima (Col. 5-6, Lines 66-2).

24. With respect to the thickness removed in claims 69 and 74, applicant has not disclosed that it is for a particular unobvious purpose.

25. As such, the limitation is obvious since it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Allowable Subject Matter

26. Claims 33, 70, 75, 81 and 82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

27. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not disclose or make obvious forming heat transfer members from encapsulant by removing portions of encapsulant with a laser, or forming heat transfer members from the encapsulant by removing portions of the encapsulant including all the limitations of the independent claim.

Response to Arguments

28. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection. However in order to expedite prosecution of this application, examiner has addressed some arguments that may still be relevant.

29. Applicant contends that one of ordinary skill in the art would not be motivated to combine Kojima with Lowry, because allegedly Kojima teaches away from Lowry. Examiner disagrees. Although applicant has attempted to distinguish Kojima by citing that it teaches a method of forming a thin device, applicant's arguments are deemed unpersuasive, because the prior art was not relied on for its packaging disclosure, but rather for types of chips. Because Lowry teaches a packaged chip that is applicable to all chip-types, one of ordinary skill in the art would be motivated to look at all disclosures showing various types of chips. In this instance, Kojima's teaching of a memory chip is

Art Unit: 2813


pertinent as a type of chip. There is no concern of teaching away, because Lowry's disclosure of a chip encompasses memory chips disclosed in Kojima. For the reasons stated above, applicant's argument is deemed unpersuasive.

Conclusion

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

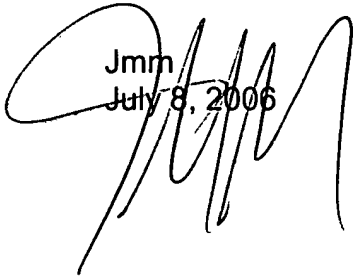

CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Application/Control Number: 09/639,917

Page 10

Art Unit: 2813

Jmm
July 8, 2006

A large, stylized handwritten signature in black ink, consisting of several loops and a long horizontal stroke, is written over the printed text.